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ABSTRACT

Analysis of the self selection patterns of participation in activities in a gifted high school program was undertaken. Numbers of males and females participating in scientific academic, aesthetic academic, and professional development activities were tallied with the number who were eligible. Percentage of eligible female participation was consistently lower than eligible male participation in scientific academic self selected activities. The difference was particularly striking in the area of computer use. Female participation in aesthetic academics was higher than males. The percentages of male and female attendance at speaker events pertaining to professonal development appeared to be balanced. A general decline was evidenced in the percentages of both males and females participating in enrichment and acceleration options offered. (CL)

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A Study of the Differences by Sex in Self-selection Patterns of Participation in Activities of a Program for High School Gifted Students

by Joan C. Leukhardt

October, 1981

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A Study of the Differences by Sex in Self-selection Patterns of Participation in Activities of a Program for High School Gifted Students

I. Introduction

In an article entitled "The Gifted Classroom" by Ernest R. House and others at University of Illinois Center for Instructional Research and Curriculum Evaluation, local programs for gifted students are described as rarely spanning K-12 and not providing "a range of options for many varieties of gifted" students.[1] In addition, they decry the fact that most efforts to provide special education for the gifted population are sporadic and fragmentary, and therefore do not deserve to be called programs:

> An educational program is an ongoing sequence of encounters of student(s) with instructional media (including staff), usually of several months duration, in which there is an identifiable theme or rationale and for which some specific outcomes can be generally expected."[2]

The program for gifted students in a western Pennsylvania school district meets that definition of a program. It is comprehensive, K-12; it is offered throughout the school year; it is inclusive, offering a range of options in which students have specially trained teachers and use special curriculum materials; it has the themes of acceleration and enrichment; it has specific goals.

The objectives delineated for each student are as follows:

The student will . . .

1. demonstrate research skills.
2. demonstrate cognitive skills of synthesis and evaluation.
3. produce original work.
4. demonstrate oral/written communication skills.
5. respond to the arts.
6. independently complete self-initiated projects.
7. demonstrate leadership.
8. select appropriate learning styles.
9. demonstrate skills of self-analysis.
10. demonstrate skills of analysis of others.

At the high school level the routes by which students can reach those goals are many and varied:

1. homogeneously grouped classes which meet graduation requirements (Hayakawa, i.e. semantics; Philosophy and Literature; Comparative Political-Economic Systems; Perspective on U.S. History; and Cultures of the World);

2. homogeneously grouped classes which are electives (Career Awareness and Planning, Architectural Drafting, Science Research, Processes and Projects, Psychology);

3. advanced classes (CBA Chemistry, Engineering Physics, Calculus, fourth levels of foreign languages, Studio Art);

4. specialized classes (Band, Stage Band, Chorus);

5. trips and speakers of an aesthetic nature;

6. trips and speakers in technical fields;

7. independent studies (such as photography, including darkroom techniques; foreign languages; crafts; instruction of younger students; research; musical arrangement; video production; play direction; surveying);

8. career experiences (such as Air Traffic controller, Banker, Veterinarian, Teacher, Engineer, Accountant, Lawyer, Court Reporter, Medical Technologist);

9. early entry into or extended study of some school subjects (Architectural Drafting, Contemporary Affairs, Calculus, Child Development, Science Research, Critical Reading and Thinking);

10. resource room use (using micro-computer, playing strategy games, engaging in simulations, studying foreign languages, doing independent investigations, perusing college catalogues);

11. involvement in the arts (accepting scholarships to Pennsylvania Governor's School for the Arts; attending Summer Happening at Indiana University of Pennsylvania; studying ballet for half a day every day at Point Park College; attending the symphony ballet, opera, theater; touring art museums, exhibits; completing independent studies in the arts and crafts);

12. participation in college-related activities (using computer facilities, attending classes, participating in one-day seminars, taking the Advanced Placement Tests).

As coordinator of this public high school program, I have made the observation that there are patterns of participation which differ according to the sex of the student.

II. Statement of Problem and Definitions

Because I would like for this program for gifted students to be equally beneficial to males and females, I want to study their participation in it. The study will pursue the question, "How does the amount and type of participation in the acceleration and enrichment activities offered by a public high school program for gifted students differ between males and females?"

My hypotheses for the outcome of this study are as follows:

1. The percentage of eligible females who participated in the scientific academic enrichment and acceleration activities of a high school program for gifted students during the first four years of its operation was lower than the percentage of eligible males who participated in the scientific academic enrichment and acceleration activities of a high school program for gifted students during the first four years of its operation.

2. The percentage of eligible males who participated in the aesthetic academic enrichment and acceleration activities of a high school program for gifted students during the first four years of its operation was lower than the percentage of eligible females who participated in the aesthetic academic enrichment and acceleration activities of a high school program for gifted students during the first four years of its operation.

3. The percentage of eligible females who participated in the professional development enrichment and acceleration activities of a high school program for gifted students during the first four years of its operation was lower than the percentage of eligible males who participated in the professional development enrichment and acceleration activities of a high school program for gifted students during the first four years of its operation.

Definitions for the terms used are listed below:

1. Gifted students are students who meet Pennsylvania state criteria for admission to a special education program:

   > . . . outstanding intellectual and creative ability the development of which requires activities or services not ordinarily provided in the regular program. Persons shall be assigned to a program for the gifted when they have an I.Q. of 130 or higher. A limited number of persons with I.Q. scores lower than 130 may be admitted to gifted programs when other educational criteria in the profile of the person strongly indicate gifted ability.[3]

2. Eligible females are those female gifted students who were provided the opportunity to participate in an activity of a high school program for gifted students.

3. Eligible males are those male gifted students who were provided the opportunity to participate in an activity of a high school program for gifted students.

4. Aesthetic academic experiences are those which deal with painting, poetry, drama, music, dance, crafts, and the humanities, the goal of which is to give insight into human nature and styles of life.[4] They are as follows: taking trips to or hearing speakers from foreign countries, theater, opera, ballet, and the symphony; participating in Pennsylvania Governor's School for the Arts or Summer Happening; touring art museums, ethnic fairs; electing classes in the arts and humanities (Philosophy and Literature; Hayakawa, semantics; fourth level of foreign languages; Art; Band; Chorus); completing projects and/or career days in the arts, crafts, humanities; early entry into Critical Reading and Thinking; taking Advanced Placement examinations in languages, literature, art, music.

5. Scientific academic experiences are those which deal with the sciences, mathematics, industry, technology, the goal of which is to give insight into the nature of the world and the attempt to utilize its resources. They are as follows: taking trips to or hearing speakers from the engineering fields, computer science, mathematics, industry; using the micro-computers; participating in science fairs, mathematics contests; touring science museums, laboratories; electing classes in science and math (Science Research, Advanced Chemistry, Advanced Physics); completing projects and/or career days in scientific fields; early entry into Calculus; extending study in Calculus and Science Research; taking the Advanced Placement examinations in biology, chemistry, physics, mathematics.

6. Professional development experiences are those which deal with academics, professions, government, economics, and national and international affairs, all which give insight into career development and society. They are as follows: taking trips to or hearing speakers from colleges and universities, businesses, professional firms, government, World Affairs Council; using Resource Room materials (strategy games, simulations, college and career information); touring broadcast studios, newspapers, mental hospitals, educational facilities, courthouses; electing classes in career development (Career Awareness and Planning, Architectural Drafting); completing projects and/or career days in the professions (law, medicine, teaching, architecture, etc.); extending study in Architectural Drafting, Nursery School, Debate, Contemporary Affairs; taking the A P exam in history.

The reader will notice the exclusion of some classes previously shown (in items one and two of the list of optional educational activities for gifted and talented students) from the above categories of "aesthetic", "scientific", and "professional development" experiences. They are the classes offered to gifted and talented students in lieu of the yearly required social studies courses or in place of a regular program elective, as follows:

YEAR	REGULAR SOCIAL STUDIES SUBJECT	OPTIONAL CLASS FOR GIFTED
Senior	Psychology (elective)	Gifted Program Psychology
Senior	United States Government (required)	Comparative Political-Economic Systems
Senior	Economics (required)	Gifted Program Economics
Junior	United States History (required)	Perspective on U.S. History
Sophomore	World Cultures (required)	Cultures of the World

The author has chosen not to include in the data the participation in the above-listed classes in the gifted program (right-hand column) as a choice for a professional development activity, since the students otherwise would be taking the course's counterpart shown in the left-hand column. Therefore, the student's disposition toward selecting a particular type of learning experience is not being revealed, but rather his or her choice for participating in a mentally homogeneously or heterogeneously grouped class.

III. Review of Literature

A review of the literature is presented here before proceeding with a description of this study, which will seek to establish the differences by sex in the self-selection patterns of participation in the activities of a high school program for gifted students. The present literature indicates that males and females have demonstrated differences in behavior in regard to school experiences and careers: in attitudes toward them, in performance in them, in expectations for them, and in selection of them.

A study by Simpson and Martinson, 1961, of gifted students in special classes and gifted students in regular classrooms with enrichment and acceleration opportunities revealed some differences in the students, not only between the two groups but also between the boys and girls within the same group: on the California Psychological Inventory, students in the special classes scored higher than their counterparts in the regular classes. Within

the gifted eighth grade classrooms, the boys were significantly higher than the girls in self-acceptance and flexibility. Within the eleventh grade gifted classrooms, the boys' scores in social presence and tolerance was higher than those of boys in the regular classrooms. However, the eleventh grade girls in special classes had scores in social presence which were lower than those of gifted girls in regular classes.[5]

The changes in self-perception of girls shown by this investigation is paralleled by changes in girls as opposed to boys that are shown by other studies. Shaw and McCuen, 1960, were the first to report that male underachievers had behaved in consistent patterns beginning in first grade, while female underachievers had been achievers until sixth grade, when their grades began to fall; in ninth grade, the underachieving girls were significantly different from achieving girls in patterns of behavior.[6] Maccoby and Jacklin, 1974, found that females perform more poorly in math, especially in later school years.[7] Further elaboration on the Maccoby and Jacklin study was given by Callahan in the Seventy-eighth Yearbook of the National Society for the Study of Education. They determined that there is great similarity between girls and boys in the basic intellectual processes, yet disparities in performance are noted beginning at certain ages. Although boys and girls perform equally well in verbal tasks at the ages of ten and eleven, girls perform better than boys in verbal areas after that age. There is no difference in quantitative performance until between the ages of nine and thirteen, when boys begin to do better than girls.[8] Fox, 1976, says that while there does not seem to be a difference between boys and girls in regard to math in elementary school, "there are differences in achievement in high school and college."[9] Ernest, 1975, reported that elementary school pupils think their own sex is better in all subjects. By high school, both sexes expect boys to excel in mathematics, and girls to excel in literature.[10]

The studies cited above show that some females exhibited negative changes in their attitudes toward themselves and in their achievement in junior high school. Further, the literature described poorer math performance by girls than boys after adolescence. Last, an investigation revealed changing expectations for and by males and females as they got older.

One study sought to attribute these changes to increased influence of peers and to increased awareness of sex role expectations.[11] Fitzpatrick, 1978, studied fourteen female tenth grade students whose I.Q. scores were over 110 but whose grade point averages were below the class mean, and therefore considered to be underachievers. These fourteen were compared to twenty-nine girls with comparable ability but with grade point averages above the class mean. Both groups were measured on standardized achievement tests, their tendencies toward other-direction, and their attitudes toward women's roles. Twenty-two held traditional views of women's roles, while twenty-one were liberal in that regard. The latter group had significantly higher grades, verbal achievement scores, and math achievement scores than the former.[12] Although Fitzpatrick did not prove a relationship between other-direction and school performance, her statistics based on role perception correlated to school performance seem valid:

> ". . . the drop in women's achievement may be due to . . . a traditional view of women's roles.[13]

Many other theories are posited to explain the cause of the change in females' school performance. We will deal with them briefly because they relate to the willingness of gifted girls to participate in a high school program for gifted students. Bardwick, 1971, found that boys' self-esteem is based on achievement while girls' achievement needs are met through another person.[14] Groth, 1969, identified Maslow's "love and belongingness" as the primary concern of females until the age of forty.[15] Callahan remarks that girls are rewarded in school more than boys for passive behavior.[16] Further,

they are exposed to books by men and about men, and in which women are portrayed as dependent people and minor characters.[17] Horner has found a "motive to avoid success" among women. In a study using the Thematic Apperception Test and a sentence-completion instrument, she found that more than sixty-five percent of the ninty females showed fear of success.[18] Girls' inclination toward affiliation rather than achievement, their encouragement to be passive rather than active, the textbook examples of females who are dependent and who avoid success could cause girls to avoid non-traditional enriched and accelerated school experiences. "Females who conform to the expected sex-role passivity and dependence may . . . capitalize less on opportunity" (than their male counterparts) determined a group of counselors.[19]

Evidence of girls' attitudes and performances in math and science would indicate they would eschew "scientific" experiences especially. Mullis, 1975, through a series of assessments in math, science, and social science, shows a dramatic difference between male and female performance in those areas—a difference which grows with age and seems not to have a logical basis (almost equal performance between the sexes in those areas at age nine, plus better performance of females over males in reading at all ages: 9, 13, 17, and adult).[20] Fox, 1975, reports that girls learn a more global approach to problem-solving, whereas boys learn analytic approaches and thus become more skilled at quantitative tasks.[21] In reviewing Hitchfield's and Terman's studies (1973 and 1925, respectively) Callahan concludes that results on intellectual differences among gifted children are inconclusive, except that males out-perform girls.[22] In addition, she summerizes a Fox observation by saying "even when gifted adolescent females are offered the option of taking part in a subject-specific acceleration program in math. . .girls are less likely to take part in these activities."[23] In another study Fox reiterates that gifted girls and boys differ to a significant degree in math involvement, even when their math ability is similar. She reports that many gifted girls expect peer

rejection for accelerating in math.[24]

This body of evidence leads one to the conclusion that girls would likely choose not to do things they do not do well (in this case, gifted program activities in the scientific fields). The demonstrated lower performance of girls than boys in math and science is compounded by the girls' greater need for acceptance, which has been presented earlier. These influences could be responsible for the pattern of participation that exists in Advanced Placement (AP) courses and tests: females are enrolled in the non-math and non-science AP Programs to a much greater degree than the math and science AP Programs. Females outnumber the males in taking AP tests only in Art, English, French, and Spanish.[25] Another factor to be considered in regard to lower female participation in scientific areas is their differential career interests and expectations. More boys than girls aspire to math and science careers as early as seventh grade.[26]

Only the few low-fear of success girls that Horner studied aspired to careers in math, physics, and chemistry. Even though the high-fear girls were equal to the low-fear girls in intellectual ability and academic success, they were studying the humanities and expected traditional careers (housewife, teacher, nurse, mother).[27] In an investigation by Marini and Greensberger, done in 1968 of 1226 boys and 1269 girls in eleventh grade, they found that girls both aspired to have and expected to have the same six occupations in the same rank order: teacher, secretary, nurse, beautician, social worker, and bookkeeper. Boys' aspirations and expectations, in addition to being substantially different from the girls', differed slightly between what they expected and what they desired:

Boys' Occupational Choices[28]

Desired	Expected
1. Teacher	1. Teacher
2. Engineer	2. Engineer
3. Mechanic	3. Mechanic
4. Athlete	4. Draftsman or Artist
5. Pilot	5. Doctor
6. Doctor	6. Pilot

The data showed that 55% of the girls' occupational aspirations and expectations were in the top six categories, while only 35% of the boys' selections were in their sex's top six.[29] This lack of interest in diverse fields could contribute to less female interest in a variety of experiences in a program for gifted students. Researchers are hoping for changes, however. Marini and Greensberger caution that their study was conducted eleven years ago, and the recent emphasis on occupational achievement for women may have created changes.[30] Callahan hopes that the Women's Liberation Movement will help females reach their potential.[31] She mentions, though, that of ten books on programming for gifted students that she studied, none took into account different approaches for boys and girls or effects on them.[32]

Among my sources, I noted a masculine bias. Although Newman in his textbook, The Gifted in Socio-educational Perspective, quotes studies which reported on both male and female subjects, he makes no reference to their different needs in "Administrative Considerations, I" and "Administrative Considerations, II" or "Instructional Considerations."[33] The only studies on gifted children cited in Psychology of Exceptional Children and Youth were based on all male subjects (a Westinghouse Talent Search of 2500 male applicants, and a Torrance study of low concept gifted male college freshman).[34] Fox, herself, makes only one reference to females in her article, "Programs for the Gifted and Talented: An Overview." She mentions that grade skipping at appropriate transition points "may be particularly crucial for females."[35] Gallagher, in the often-quoted Teaching the Gifted Child, uses four case histories throughout the book to serve as examples of gifted children--three are boys, one is a girl. He refers to the girl as a member of a minority group: "a girl--a gifted girl."[36] Like Newman he cites studies dealing with gifted females but does not mention them apart from males when he makes programmatic suggestions. He seems to take

a non-committal approach when he says,

> Whether the changing attitude of society toward a greater acceptance of intellectual performance of gifted women will change the performance of gifted girls in educational settings will be interesting to note.[37]

Gallagher does not recommend any educational intervention to ameliorate society's influence in stifling girls:

> The educational implications of comparing boys and girls seem quite limited. The fact that there is an <u>average</u> difference between boys and girls with regard to performance on this test or that variable does not have implications for individual children.[38]

More recently, leaders in the field of education for the gifted feel differently. The editors of <u>Educating the Ablest</u> introduce a chapter with these words:

> In the original edition of this book there was no chapter on women. The fact that there is one in this revision recognizes the rapid cultural advances made in the interim [8 years] regarding discrimination against gifted women and the consequent cultural waste of their potential creativity. This loss is probably the greatest reparable error which our society makes, and the recent attention given to the issue of developing the talents of gifted women testifies to its importance.[39]

Several researchers speak to the issue of studying programs for the gifted to learn how they can best meet the need to develop girls' talents. Callahan feels that further research on all types of programs for the gifted is "needed before any firm conclusions can be drawn about the gifted student and interactions of age, subject area, type of program, and sex.[40] Fox states that the purpose of doing these studies is "to guide us in constructing programs which will work to broaden the values, needs, and interests of females within nonthreatening structures."[41] Newland suggests "comparative studies of the gifted and nongifted, each by sex . . . ."[42] Rodenstein, et. al., advise collecting data from existing programs in objective (written material) and

subjective (interviews and observations) forms in order to improve career development in the gifted and talented.[43]

This study was designed to determine whether males and females differ in their choices of optional activities in which they can participate as members of a program for high school gifted students. Should patterns of self-selection emerge which show that one or both of the sexes are not profitting from the variety of options offered, a subsequent study could seek to determine the reasons and possible remedies.

IV. Design of Study

A. Gathering of Data

The population studied was the entire number of students identified as gifted in a western Pennsylvania middle-class suburban three-year high school having an approximate total enrollment of 2000. The data were gleaned from the first four years of the operation of a formal, partially federally funded program for g/t students. (Some advanced classes were instituted before the inception of this program, and therefore continue to be district-financed.) Table 1 shows the years and the size of the population included in this study. Table 2 shows the years and the total school enrollment.

TABLE 1. YEARS AND NUMBERS OF STUDENTS STUDIED

School Year	Grade 10			Grade 11			Grade 12			
	M	F	T	M	F	T	M	F	T	T
1976-77 Sept.-June	27	16	43	24	19	43	18	22	43	129
1977-78 Sept.-Jan.	14	15	29	35	22	57	24	19	43	129
Feb.-June	24	22	36	35	22	57	24	19	43	136
1978-79 Sept.-Oct.	18	19	37	35	29	64	39	28	67	168
Nov.-June	23	22	45	35	29	64	39	28	67	176
1979-80 Sept.	34	32	66	28	24	52	39	31	70	188
Oct.-Dec.	34	34	68	28	24	52	39	31	70	190
Jan.-June	40	39	79	28	24	52	39	31	70	201

M = identified gifted males
F = identified gifted females
T = total identified gifted

TABLE 2. TOTAL NORWIN HIGH SCHOOL ENROLLMENT 1976-80

		GRADES 10	11	12	TOTAL
1976-77	Male	385	371	349	1105
	Female	341	360	383	1084
	Total	726	731	732	2189
1977-78	Male	338	367	362	1067
	Female	328	335	346	1009
	Total	666	702	708	2076
1978-79	Male	356	317	352	1025
	Female	354	315	322	991
	Total	710	632	674	2016
1979-80	Male	357	326	303	986
	Female	386	331	310	1027
	Total	743	657	613	2013

Sources of information for the study were the lists of students who participated in the enrichment and acceleration activities of the program for gifted students: class rosters; organization membership lists (chorus, band); attendance lists for guest speaker presentations; attendance lists for educational trips; itemized lists of projects, independent studies, career experiences, involvement in the arts, college-related participation, early entry or extended study in courses, and use of the resource room (including the micro-computer logs).

B. Compiling of Data

Participation lists were divided by the school year so that data would be available separately for the 1976-66, 1977-78, 1978-79, and 1979-80 school years. Within each school year, the lists were then categorized as either scientific academic or aesthetic academic. At this time, it became evident that there were a number of activities which fit neither classification. It was decided that a third "neutral" category labled professional development should be added. Next, each category

was subdivided as to the type of activity: speakers, trips, classes, independent projects, resource room, discussion groups and meetings, math competition, and computer use. Tallies were then made of the number of males and the number of females who participated in each type of activity in each category.

Because many of the activities provided for gifted students had prerequisites for participation (such as enrollment in a particular class or being at a specific grade level), it seemed desirable to calculate the numbers of males and females who were eligible to participate in each event. Eligibility numbers were determined by adding up the males and females invited to participate in each experience, based on the numbers of identified gifted students at the time of the activity.

Finally, percentages were found of those who participated out of those who were eligible, i.e. in the case of scientific academic speakers in the first year of study, the following data were found: males participated 186 times out of the 414 eligibilities; therefore, 45% of the eligible male participations occurred; females participated 68 times out of 342 eligibilities, therefore, 20% of the eligible female participations occurred.

When the percentages of computer users based on eligible males and females were calculated, it was felt that those numbers did not sufficiently reveal the differences in computer use by each sex. So in addition to using the computer logs to tally the number of males and females who used the computer, the numbers of entries made in the log (indicating hours of computer use) by each sex were totaled. This value reflected the number of repeated uses of the computer by individuals, allowing the percentages of computer time used by males and females to be computed.

C. Limitations and Delimitations

Three limitations exist in this research design. The study is limited to four school years because that is the length of time special provisions have been provided in a programatic format in the observed school. Also, the options offered gifted students may not have been diverse enough to have appealed to each student's interest in aesthetic and/or scientific fields. Another limitation which may prevent broad generalization is that the data was gathered at a suburban, middle class school.

A delimitation of the study is the equal weighting of each activity, even though each was engaged in for varying amounts of time. An extreme example of this is the Engineering Physics class which meets eighty-two minutes a day for the 180-day school year and qualified in this study as one scientific academic activity, compared to a visit to an art museum for half a day, which was considered one aesthetic academic activity. The reverse is demonstrated by the comparison of attending a twenty-two hour photography workshop, an aesthetic academic activity, with hearing a speaker on computer science for forty-one minutes, a scientific academic activity.

Consideration was given to weighting each activity by its length, but the decision was made that it would be too involved for this study's purpose, which is to gain insight into students' <u>self-selection</u> of activities in a high school program for gifted students.

V. Results of the Study

A. Scientific Academic Participation

As Table 3 shows, the percentage of eligible female participation was consistently lower than the percentage of eligible male participation in the scientific academic self-selected activities of a program for high school gifted students. The difference between percentage of male and female involvement is particularly striking in the area of computer use, as revealed in Table 4.

TABLE 3. PARTICIPATION IN SCIENTIFIC ACADEMIC ACTIVITIES
(Shown in percentages of those eligible)

Activity	1976-77 M	1976-77 F	1977-78 M	1977-78 F	1978-79 M	1978-79 F	1979-80 M	1979-80 F
Speakers	45	20	27	9	24	12	17	6
Trips	21	14	15	12	5	4	8	5
Classes	45	22	31	12	32	13	26	11
Independent Projects	10	3.5						
Discussion Groups, Meetings			8	4	1	0		
Math Competition			20	5			8	6
Computer Use			20	5	40	23	42	6

M = male
F = female

TABLE 4. MICRO-COMPUTER TIME

	1977-78 M	1977-78 F	1978-79 M	1978-79 F	1979-80 M	1979-80 F
Hours of Computer Use	327	86	1184	148	627	72
Percentage of Time of Computer Use	79	21	89	11	90	10

M = male
F = female

B. Aesthetic Academic Participation

As Table 5 shows, in general the percentage of eligible male participation was lower than the percentage of eligible female participation in the aesthetic academic self-selected activites of a program for high school gifted students.

TABLE 5. PARTICIPATION IN AESTHETIC ACADEMIC ACTIVITIES
(Shown in percentages of those eligible)

Activity	1976-77 M	1976-77 F	1977-78 M	1977-78 F	1978-79 M	1978-79 F	1979-80 M	1979-80 F
Speakers	12	27	16	32	11	13	10	12
Trips	12	12	8	24	14	19	12	19
Classes	7	10	9	14	10	11	11	12
Independent Projects	7	9						

M = male
F = female

C. Professional Development Participation

As Table 6 shows, the percentage of eligible female participation was similar in some types of self-selected activities of a program for high school gifted students to the percentage of eligible male participation in those self-selected activities. In other types of self-selected activities, notably classes and resource room use, the percentage of eligible female participation was lower than the percentage of eligible male participation.

TABLE 6. PARTICIPATION IN PROFESSIONAL DEVELOPMENT ACTIVITIES
(Shown in percentages of those eligible)

Activity	1976-77 M	1976-77 F	1977-78 M	1977-78 F	1978-79 M	1978-79 F	1979-80 M	1979-80 F
Speakers	25	18	13	14	25	22	13	16
Trips	13	15	14	18	8	6	7	7
Classes			10	7	11	7	6	4
Independent Projects	6	19						
Resource Room					29	14	40	18
Discussion Groups, Meetings			7	13				

M = male
F = female

VI. Discussion of Data

Upon examination of the results as shown in the tables, one notices the following significant differences by sex in self-selection patterns of participation in activities of a program for high school gifted students:

A. Scientific Academic Activities

1. Two to three times as many eligible males as eligible females attended speaker events on a scientific theme during each of the four years of the study.

2. Males outnumbered females in participation in trips of a scientific nature during each year of the study—the percentages seem particularly significant in the first and fourth years of the study.

3. Males were significantly higher in enrollment in the scientific academic classes in all four years of the study. The discrepancy between male and female enrollment is larger in the last three years of study than in the first year.

4. The percentage of males using the micro-computer was significantly greater than the percentage of females, especially in 1977-78 and 1979-80. I believe the percentages of male and female computer users in 1978-79 are deceptive because the male students logged onto the computer repeatedly, while the female students logged on infrequently. In the three years of computer use, males used the computer 79% of the time in 77-78, 89% of the time in 78-79, and 90% of the time in 79-80.

B. Aesthetic Academic Activities

1. Males were significantly lower in percentage of attendance at speaker events of an aesthetic theme during the first two years of the study.

2. Males were significantly lower in percentage of participation in trips of an aesthetic nature than females during the last three years of the study.

3. Males were significantly lower in percentage of enrollment in the aesthetic academic classes in the first two years of the study.

C. Professional Development Activities

1. The percentages of male and female attendance at speaker events pertaining to professional development seems to be balanced through the years.

2. The percentages of male and female participation in trips of a professional nature seems balanced through the years.

3. Males seem to be significantly higher in enrollment in the professional development classes (Career Awareness and Planning, Architectural Drafting).

4. Males used the Resource Room in significantly larger proportions than females in both the years the Room has been in operation.

The findings noted above support two hypotheses of this study:

1. Female participation was significantly lower than male participation in scientific academic enrichment and acceleration activities of a high school program for gifted students.

2. Male participation was significantly lower than female participation in aesthetic academic enrichment and acceleration activities of a high school program for gifted students.

The third hypotheses is partially supported:

3. Female participation was significantly lower than male participation in part of the professional development activities of a high school program for gifted students.

For the purpose of analyzing the data further, figures were drawn to depict the percentage of eligible male and female participation in each type of activity over the years of the study. (Refer to Figures 1-4.) The first impression derived from these figures is that the percentage of participation has generally declined through the years for students of both sexes.

Upon close scrutiny, a few minor deviations from that trend are noticed. Male participation in aesthetic academic trips rose in the third year, then fell in the fourth year to the same percentage as the first year (Fig. 2). Female participation in aesthetic academic trips rose from the first to the fourth year, but peaked in the second year (Fig. 2). Male and female participation rose slightly in aesthetic academic classes over the years (Fig. 3). A third exception to decreased participation is that resource room use increased for both sexes, although it should be noted that that option was available only for the last two years in the study (Fig. 4).

Further explanation should be made of the entries on Fig. 4. Independent studies were completed under that title only in the first year; in subsequent years, the same type of activity was engaged in as individual or small-group projects in schedules classes which began in 1977-78. Computer use climbed sharply from the second year to the third year; this was probably due to the fact that the micro-computer was not operational until February of the second year.

Fig. 1. SPEAKERS

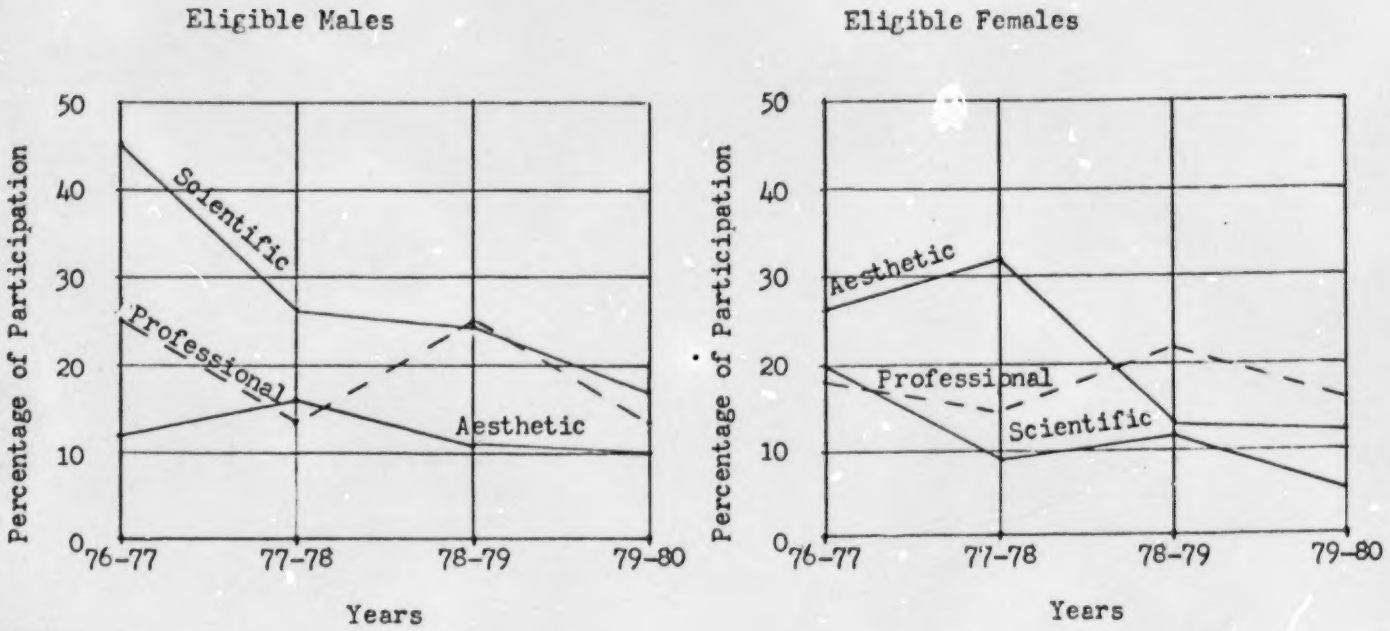


Fig. 2. TRIPS

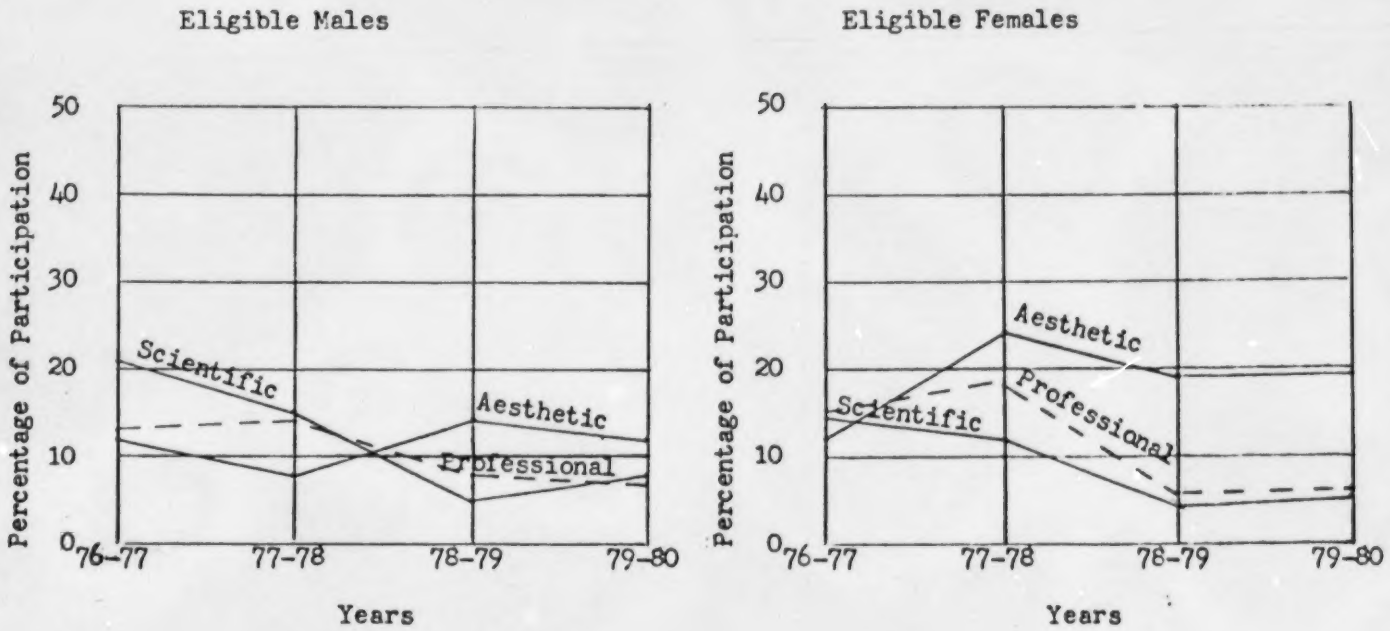


Fig. 3. CLASSES

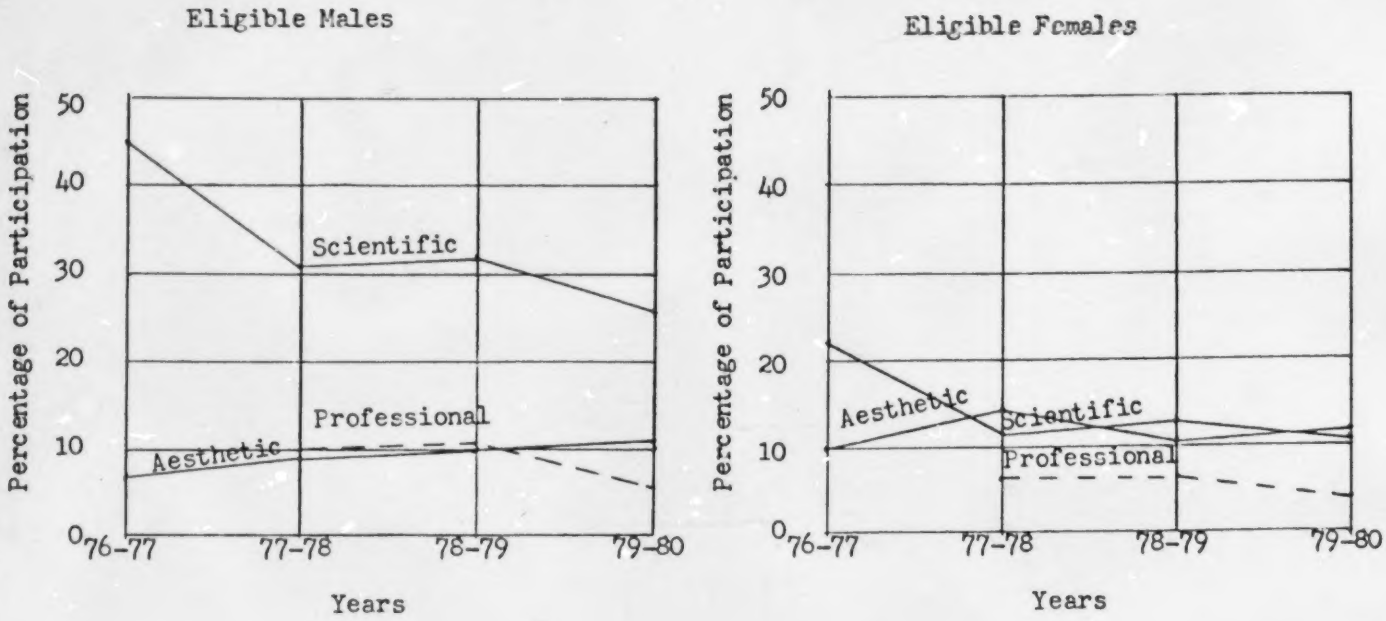
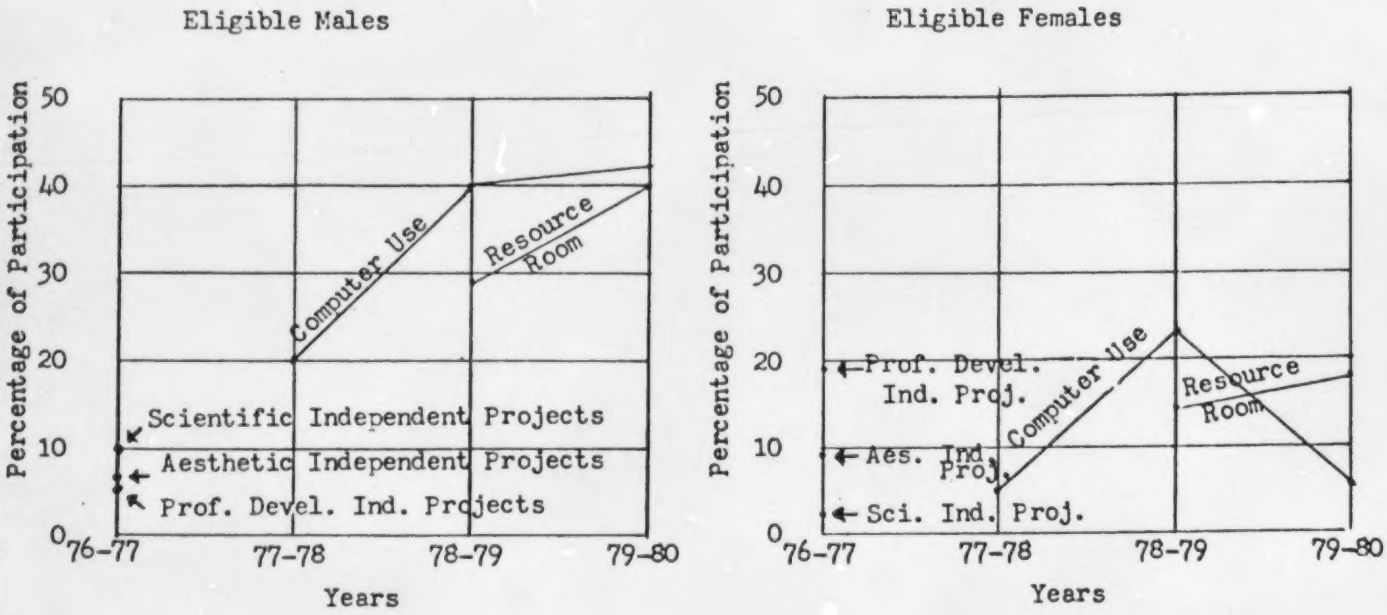
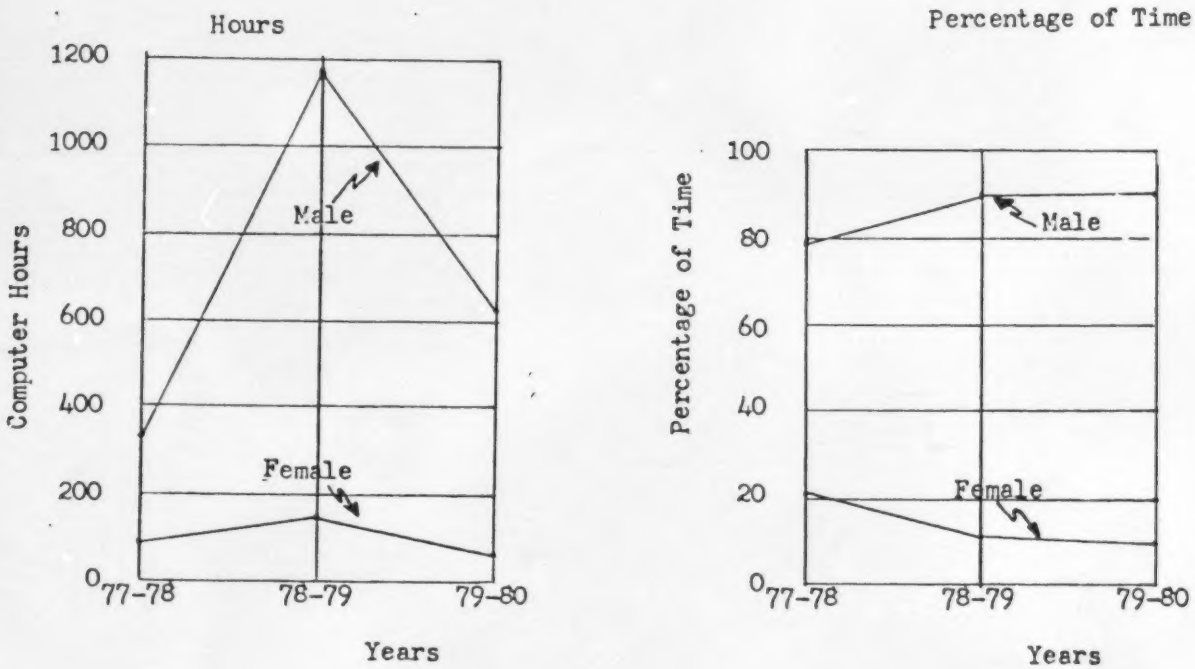


Fig. 4. OTHER ACTIVITIES



In order to understand the computer usage better, Fig. 5 was devised. It delineates the hours of computer usage and the percentage of computer time by sex. Both male and female computer use peaked in the second year of its operation. A possible explanation for the decline in hours in the third year is that the school's science department installed two new, advanced micro-computers during the third year. Some students transferred their computer time to those computers. The important point about computer use for the purposes of this study is revealed in the second graph of Fig. 5: the percentage of male-student time on the computer ranges from 79% to 90%, while the percentage of female-student time on the computer declines from 21% to 10%.

Fig. 5. COMPUTER USE



VII. Summary of Findings

Males chose to participate more than females in the scientific academic activities of a program for high school gifted students. Most significant was the difference by sex in the use of the micro-computer. Male usage far outweighed female usage.

Females chose to participate more than males in the aesthetic academic activities of a program for high school gifted students.

Males and females equally chose to participate in some activities of a professional development nature, while males chose to participate more than females in other activities of a professional development nature.

Last, plotting the data disclosed a general decline in the percentages of both males and females participating in the enrichment and acceleration options offered in a high school program for gifted students.

VIII. Speculations on Findings

Personal reflection on this study's findings, which showed that self-selection patterns of participation in the activities of a program for high school gifted students followed sex-role stereotypic behavior (males eschewing aesthetic academic activities and females eschewing scientific academic activities) has led to the following speculations on the situation:

1. In the middle class community which is the setting of the study, traditional sex role behavior is expected and positively reinforced--both at home and at school.

2. In the school there are no role models of successful women in scientifically related fields--the mathematics and science departments have seventeen male teachers and no female teachers.

3. On the entire high school staff, females are underrepresented--they comprise only thirty-four percent of the staff, and they are concentrated in the traditional fields of languages and home economics.

4. Among the female students there is a general prizing of the image of the dumb but beautiful girl--many do not want to be considered intellectual.

5. Among the staff members there is a general sense that classes should not be missed, and many put pressure on students who want to be excused*--females may be less willing to endure this intimidation than males.

6. On a testing instrument measuring risk-taking,[44] males in the program have scored higher than females--the males may exhibit that behavior by trying new experiences (going on career days, using the microcomputer).

7. Besides the possibility of male students being more willing to be identified with intellectual activities than females, they may relate better to the female coordinator than the female students--thus feeling more comfortable to go on the trips which she chaperones and to use the resource room which she oversees.

These seven inferences provide food for thought, and the ideas could be pursued in future studies.

IX. Implications for Further Study

The significant differences by sex in self-selection patterns of participation in activities of a program for high school gifted students as shown by this study should be investigated further. Causes for the lower female participation in scientific academic activities should be determined; causes for the lower male participation in aesthetic activities should be determined. Once causes have been found, changes can be made which could result in increased involvement in the program. It could be modified and/or environmental factors could be ameliorated. If circumstances are changed so that girls and boys avail themselves of the offerings for gifted students without regard to traditional sex-role expectations, they will benefit, as will society.

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* As reported in "Evaluation of Secondary Gifted Program SOAR," Norwin School District, May, 1979, teachers judged the missing of classes to be detrimental to learning and grades, and students felt pressure when they missed classes. In addition, there has been recent staff and administrative concern that Scholastic Aptitude Test scores are falling because students have been excused from class. In an effort to determine if there was a correlation between the two circumstances, this author conducted a Pearson's Correlation Coefficient. The results showed no significant correlation between hours excused from school and SAT scores.

NOTES

[1]Ernest R. House, et.al. "The Gifted Classroom" ED054594, 1975, p.14.

[2]Ibid., p.8.

[3]Title 22, "Standards for Special Education," Pennsylvania Bulletin, Volume 7, Number 40, October, 1977.

[4]Harry S. Broudy, Enlightened Cherishing: An Essay on Aesthetic Education (Urbana, Ill.:University of Illinois Press, 1972), p.53.

[5]Warren G. Findley and Miriam M. Bryan. "Ability Grouping: 1970 II. Impact of Ability Group on School Achievement, Affective Development, Ethnic Separation, and Socioeconomic Separation." ED048382, 1970, p.27.

[6]Jody L. Fitzpatrick, "Academic Under-achievement, Other-Direction, and Attitudes Toward Women's Roles in Bright Adolescent Females," Journal of Educational Psychology, Vol. 70 (4), 1978, p.645.

[7]Ibid., p.649.

[8]Carolyn M. Callahan, "The Gifted and Talented Woman," in The Gifted and the Talented: Their Education and Development. The Seventy-eighth Yearbook of the National Society for the Study of Education, ed. A. Harry Passow (Chicago: the University of Chicago Press, 1979) p.403.

[9]Lynn H. Fox, "Gifted Girls: Scientists and Mathematicians of the Future" ED135598, 1979, p.3.

[10]Callahan, p.414.

[11]Fitzpatrick, p.645.

[12]Ibid., p.648.

[13]Ibid., p.649.

[14]Julia Simpson, "Developmental Process Theory as Applied to Mature Women," in Educating the Ablest: A Book of Readings on the Education of Gifted Children, 2nd ed., eds. John Curtis Gowan, Joe Khatena, and E. Paul Torrance (Itasco, Ill.: F. E. Peacock Publishers, Inc., 1979), p.379.

[15]Judith Rodenstein, L. R. Pfleger, and Nick Colangelo, "Career Development of Gifted Woman, " in Educating the Ablest: A Book of Readings on the Education of Gifted Children, 2nd ed., eds. John Curtis Gowan, Joe Khatena, and E. Paul Torrance IItasca, Ill.: F. E. Peacock Publishers, Inc., 1979, p.385.

[16]Callahan, p.415.

[17]Ibid., p.412.

NOTES, cont.

[18]Matina Horner, "Fail: Bright Women," Readings in Psychology Today, 3rd ed., ed. Jaones B. Maas (Del Mar, Calif.: CRM Books, 1974) p.259.

[19]Rodenstein, et. al., p.386.

[20]Ina Mullis, V. S. "Educational Achievement and Sex Discrimination". ED115701, 1975, 19pp.

[21]Callahan, p.405.

[22]Ibid., p.406.

[23]Ibid., pp.417-18.

[24]Fox, 1976, p.3.

[25]Callahan, p.418.

[26]Fox, 1976, p.4.

[27]Horner, p.260.

[28]Margaret M. Marini and Ellen Greensberger. "Sex Differences in Occupational Aspirations and Expectations," Sociology of Work Occupations, Vol. 5 (2), 1978, p.156.

[29]Ibid., p.155.

[30]Ibid., p.175.

[31]Callahan, p.423.

[32]Ibid., p.416.

[33]T. Ernest Newland, The Gifted in Socio-educational Perspective. (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1976).

[34]William M. Cruickshank, ed., Psychology of Exceptional Children and Youth, 3rd ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971).

[35]Lynn H. Fox, "Programs for the Gifted and Talented: an Overview," in The Gifted and the Talented: Their Education and Development. The Seventy-eighth Yearbook of the National Society for the Study of Education, ed. A. Harry Passow (Chicago: the University of Chicago Press, 1979), p.114.

[36]James J. Gallagher, Teaching the Gifted Child, 2nd ed. (Boston: Allyn and Bacon, Inc. 1975), p.47.

[37]Gallagher, p.63-64.

[38]Ibid., p.51.

NOTES, cont.

[39]John Curtis Gowan, Joe Khatena, and E. Paul Torrance, eds., Educating the Ablest: a Book of Readings on the Education of Gifted Children, 2nd ed. (Itasco, Ill.: F. E. Peacock Publishers, Inc., 1979), p.362.

[40]Callahan, p.419.

[41]Ibid., p.420.

[42]Newland, p.329.

[43]Rodenstein, et al., p.387.

[44]Frank E. Williams, "How Do You Feel About Yourself?", A Total Creativity Program (Englewood Cliffs, N.J.: Educational Technology Publications, Inc. 1972).

BIBLIOGRAPHY

Broudy, Harry S. Enlightened Cherishing: An Essay on Aesthetic Education. Urbana, Illinois: University of Illinois Press, 1972.

Callahan, Carolyn M. "The Gifted and Talented Woman." The Gifted and the Talented: Their Education and Development. The Seventy-eighth Yearbook of the National Society for the Study of Education. ed. A. Harry Passow. Chicago: University of Chicago Press, 1979. 401-23.

Cruishank, William M., ed. Psychology of Exceptional Children and Youth, 3rd ed. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971.

Findley, Warren G. and Bryan, Miriam M. "Ability Grouping: 1970 II. Impact of Ability Grouping on School Achievement, Affective Development, Ethnic Separation, and Socioeconomic Separation." ED048382. 1975, 75pp.

Fitzpatrick, Jody L. "Academic Underachievement, Other-Direction, and Attitudes toward Women's Roles in Bright Adolescent Females." Journal of Educational Psychology, 70 (4) (1978), 645-650.

Fox, Lynn H. "Gifted Girls: Scientists and Mathematicians of the Future." ED135598. 1976, 15pp.

_____ "Programs for the Gifted and Talented: an Overview." The Gifted and the Talented: Their Education and Development. The Seventy-eighth Yearbook of the National Society for the Study of Education. ed. A. Harry Passow. Chicago: University of Chicago Press, 1979. 104-26.

Gallagher, James J. Teaching the Gifted Child, 2nd ed. Boston: Allyn and Bacon, Inc., 1975.

Gowan, James Curtis, Joe Khatena, and E. Paul Torrance, eds. Educating the Ablest: a Book of Readings on the Education of Gifted Children, 2nd ed. Itaska, Ill.: F. E. Peacock, Inc. 1979.

Horner, Matina. "Fail: Bright Women." Readings in Psychology Today, 3rd ed. ed. James D. Maas. Del Mar: Calif.: CRM Books, 1974. 258-60.

House, Ernest R., et.al. "The Gifted Classroom." ED054594. 1971, 166pp.

Leukhardt, Joan C. and Diane W. Wiley. "Evaluation of Secondary Gifted Program SOAR." North Huntingdon, Pa.: Norwin School District, 1979.

Marini, Margaret and Greensberger, Ellen. "Sex Differences in Occupational Aspirations and Expectations." Sociology of Work Occupations, 5 (2) (1978), 147-178.

Mullis, Ina V. S. "Educational Achievement and Sex Discrimination." ED115701. 1975, 19pp.

Newland, T. Ernest. The Gifted in Socio-educational Perspective. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1975.

Rodenstein, Judith; Pfleger, L. R. and Colangelo, Nick. "Career Development of Gifted Women." Educating the Ablest: a Book of Readings on the Education of Gifted Children, 2nd ed. Itaska, Ill.: F. E. Peacock Publishers, Inc., 1979. 383-90.

Simpson, Julia. "Developmental Process Theory as Applied to Mature Women." Educating the Ablest: a Book of Readings on the Education of Gifted Children, 2nd ed. Itaska, Ill.. F. E. Peacock Publishers, Inc., 1979. 371-83.

Title 22, "Standards for Special Education," Pennsylvania Bulletin, Volume 7, Number 40, October, 1977.

Williams, Frank E. A Total Creativity Program. Englewood Cliffs, New Jersey: Educational Technology Publications, Inc., 1972.